

1/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--THERMODYNAMIC STUDY OF SOLID PHASE DIOPSIDE FORMATION REACTIONS -U-  
AUTHOR--(03)-BASOVA, N.S., ZHUNINA, L.A., KALININA, A.M.  
COUNTRY OF INFO--USSR *B*  
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(1), 164-5  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--CHEMISTRY  
  
TOPIC TAGS--THERMODYNAMIC ANALYSIS, SILICATE, CALCIUM, MAGNESIUM,  
ACTIVATION ENERGY  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
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CIRC ACCESSION NO--AP0118021  
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2/2 023

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118021

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMODYNAMIC POSSIBILITY OF DIOPSIDE FORMATION FROM VARIOUS STARTING COMPONENTS WAS INVESTIGATED. THE EQUATIONS ARE SET UP SHOWING THE TEMP. DEPENDENCIES OF THE FREE ENERGY. THE UPPER TEMP. LIMIT WAS 1600DEGREESK. THE DELTA F VALUE OF THE DIOPSIDE FORMATION REACTION FROM ALK. EARTH CARBONATES AND QUARTZ GRADUALLY DECREASES WITH INCREASING TEMP., AND AT 1200-1600DEGREESK IT ACQUIRES NEG. VALUES, CHARACTERIZING THE POSSIBILITY OF THE REACTION TAKING PLACE IN THE DIRECTION OF THE DIOPSIDE FORMATION. THE ACTIVATION ENERGY OF THE PROCESS IS SIGNIFICANTLY GREATER THAN THAT OF THE DIOPSIDE FORMATION REACTION FROM METASILICATES OF CA AND MG. FACILITY: INST. KHIM. SILIKATOV IM. GREBENSHCHIKOVA, LENINGRAD, USSR.

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BARSOVA, R. I.

SD:JPRS 54539

12 NOV 71

UDC: 616.13-036.12:036.21(470.1)

CHRONIC PROGRESSIVE LUNG DISEASE AS A REGIONAL PATHOLOGY IN SOME NORTH-EASTERN PARTS OF THE USSR

All (Innate)

Article by A.P. Arsenin, P.I. Berezina, L.K. Botvinnik, A.A. Zhavoronkov, E.E. Kent, A.G. Mandel'nyak, V.S. Litvinikov, Institute of Human Topography of the USSR Academy of Medical Sciences, Moscow, Magedonskaya Oblast Hospital, Moscow, Yevskiy Akademicheskii Meditsinskii Nauch SSR, Russian, No 10, 1971, pp 3-141

At the present time, the attention of pathologists and clinicians is being drawn more and more to chronic progressive diseases of the lungs resulting in fibrosis and emphysema. For many years, chiefly in England, they were called chronic bronchitis which, since the times of Bohnham (1825), has been considered practically a traditional English disease. It is not by chance that Stokes (1837) in his classical textbook on thoracic pathology devoted much more attention to it than to tuberculosis. English researchers have authored many works dealing with the symptomatology, X-ray diagnostics, and possible etiology of chronic bronchitis. Its traditional link with the humid climate of the British Isles, exacerbation of the disease during the cold season have become firmly fixed in the consciousness of many physicians

A comprehensive monograph dealing with chronic bronchitis has been published by a team of English physicians and edited by Oswald (1953). This author demonstrates, in particular, that in England and Wales, 30,000 people died of bronchitis in 1953, which constitutes 7 percent of all causes of death. To this we should add 21,000 deaths due to pneumonia, 2,000 deaths due to bronchiectasis, and 3,000 deaths because of asthma. It is not by chance that we compare these indices, since bronchitis, asthma, bronchiectasis, as well as emphysema are often combined, and it is only the chief clinical syndrome that makes it possible to separate them into different categories.

The incidence of chronic bronchitis is described in contradictory ways. However, there is no doubt that under specific climate conditions this disease could be one of the chief causes of disability. Evidently, the sickness begins at an early age (20-30 years), but most deaths are referable to the elderly and aged (Openski). Among its victims there is prevalence of individuals in specific professions, but metallurgical, transportation, and communications workers are stricken particularly often. In England, bronchitis does not spare agricultural workers, unskilled laborers, and representatives of other occupational groups.

USSR

BASS, F. G., VATOVA, L. B., GUREVICH, Yu. G., Institute of Radio Physics  
and Electronics, UkrSSR Academy of Sciences, Khar'kov

"Propagation of Electromagnetic Waves in Conductors With Nonstandard Law of  
Electron Dispersion"

Leningrad, Fizika Tverdogo Tela, Vol 13, No 10, Oct 73, pp 3053-3061

Abstract: The authors investigate various types of waves which may propagate  
in semiconductors with a nonstandard law of dispersion. It is shown that  
under certain conditions deviation from the quadratic law of dispersion for  
certain incident wave amplitudes leads to a situation where the fundamental  
and harmonics propagate in the semiconductor at a velocity which coincides  
with that of the wave in the linear theory.

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Acc. Nr:

**A0047610**

Abstracting Service:

INTERNAT. AEROSPACE ABST.

Ref. Code:

5-9 UR 0141

A70-25156 # Propagation of strong electromagnetic waves of arbitrary polarization in nonlinear media (Rasprostraneniye sil'nykh elektromagnitnykh voln proizvol'noi polarizatsii v nelineinykh sredakh). F. G. Bass and Yu. G. Gurevich (Akademiya Nauk Ukrainskoi SSR, Institut Radiofiziki i Elektroniki, Kharkov, Ukrainian SSR). *Radiofizika*, vol. 13, no. 2, 1970, p. 243-250, 7 refs. In Russian.

Investigation of the propagation of electromagnetic waves in a nonlinear medium for the case where a plane wave of arbitrary polarization is normally incident on a sharply defined vacuum-plasma interface. Wave propagation is examined in the presence of a constant magnetic field; the nonlinearity of the plasma medium is caused by heating of the electron gas—in this case, the permittivity of the medium is a function of wave amplitude. Mathematically, the problem is reduced to the solution of systems of Maxwell equations and nonlinear heat balance equations. It is shown that in a zero approximation with respect to a small parameter associated with the low degree of damping, the medium contains two waves propagating with refractive indices and damping coefficients corresponding to normal waves in a linear medium.

T.M.

REEL/FRAME

**19791176**

Conferences

USSR

BASS, F. G., BARANSKIY, P. I., GUREVICH, YU. G., KOROLYUK, S. L., POTYKEVICH, I. V., SAMOYLOVICH, A. G.

"All-Union Conference on the Physics of Semiconductors in Strong Magnetic and Electric Fields"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 5, No 3, March 1971, pp 587-591

Abstract: This article contains brief reviews of the reports given at the All-Union Conference on the Physics of Semiconductors in Strong Magnetic and Electric Fields and held by the Scientific Council on Physics and Chemistry of Semiconductors of the USSR Academy of Sciences, the Institute of Physics of Metals of the USSR Academy of Sciences and the Problem Scientific Research Laboratory of Anisotropic Semiconductors of the Chernovtsy State University from 14 to 17 October 1970, in Chernovtsy.

The reports were concentrated around the following problems: 1) kinetic phenomena in semiconductors in strong magnetic fields; 2) kinetic and optical phenomena in strong electric and magnetic fields; 3) electron-hole plasma in strong electric and magnetic fields; 4) electric instabilities

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BASS, F. G., et al., Fizika i Tekhnika Poluprovodnikov, Vol 5, No 3, March 1971, pp 587-591

in strong fields; 5) dimensional effects and volt-ampere characteristics. Seventy-six reports were given. The next conference, which will be participated in by the member countries of the CEMA, will be held in September-October 1971, in Leningrad.

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USSR

BASS, F. G., GUREVICH, YU. G., and CHAVCHANIDZE, O. N., Institute of Radiophysics and Electronics, Academy of Sciences UkrSSR, Khar'kov; Institute of Cybernetics, Academy of Sciences Georgian SSR, Tbilisi

"Nonlinear Propagation of Low-Frequency Spiral Waves in Semiconductors"

Leningrad, Fizika Tverdogo Tela, Vol. 12, No. 8, Aug 70, pp 2365-2370

Abstract: The passage of a low-frequency spiral wave pulse incident on a semi-infinite semiconductor is studied. The authors had previously developed a theory of nonlinear propagation of electromagnetic waves with a frequency  $\omega > \nu_e$ , where  $\nu_e$  is the frequency of collisions between current carriers and the scattering centers with energy transfer. This article studies the case of propagation of strong electromagnetic waves with a frequency  $\omega \leq \nu_e$  and is limited to weakly attenuating waves which are of two types: a wave propagating in a semiconductor in the absence of a magnetic field and a spiral wave. If the magnetic field is absent, the wave length in the semiconductor is determined by the formula

$$\lambda = c/\omega\sqrt{\epsilon_0},$$

where  $\epsilon_0$  is the dielectric permeability of the lattice and  $c$  is the velocity of light

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BASS, F. G., et al, Fizika tverdogo tela, Vol. 12, No. 8, Aug 70, pp 2365-2370

in a vacuum. In typical semiconductors with one type of carrier  $\epsilon_0 \sim 16$  and  $v_e \sim 10^9 \text{ sec}^{-1}$ , and therefore the frequency of the wave must be  $10^8 \text{ sec}^{-1}$ . The wave length  $\lambda$  is then equal to approximately  $10^2 \text{ cm}$  and the attenuation is at least an order greater; for any realistic sample dimensions the problem does not have any sense and therefore only the spiral wave remains. It is shown that the frequency width of the wave pulse is compressed under some mechanisms for the scattering of an electron pulse due to heating of the electrons and the width expands under other scattering mechanisms. If electrons are scattered by acoustical phonons, heating of the carriers leads to a sharp compression of the frequency width of the pulse. It is also shown that the propagation of the basic harmonic of a monochromatic spiral wave of low frequency is described by formulas for the propagation of a high-frequency spiral wave.

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USSR

BASS, F. G. AND GRANOVSKIY, M. YA., Institute of Radiophysics and Electronics,  
Academy of Sciences UkrSSR, Khar'kov

"Effect of Phonon Heating on the Propagation of Strong Electromagnetic Waves in  
Semiconductors"

Leningrad, Fizika Tverdogo Tela, Vol. 12, No. 8, Aug 70, pp 2437-2441

Abstract: The nonlinear propagation of electromagnetic waves associated with the heating of electrons and phonons is considered. In earlier studies of the propagation of strong electromagnetic waves in semiconductors it was assumed that long-wave phonons with which conductivity electrons basically interact remain in equilibrium; this is possible if the interaction of long-wave phonons with short-wave phonons is more considerable than the interaction of long-wave phonons with conductivity electrons. It was shown in several theoretical studies that this situation does not always occur and in a certain range of temperatures and external electric fields dragging and heating of long-wave phonons can play an important role and short-wave phonons carry out heating transfer. It is shown that in the case of strong electron-phonon interaction the relationship between electron temperature and field amplitude

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BASS, F. G., and GRANOVSKIY, M. YA., Fizika tverdogo tela, Vol. 12, No. 8, Aug 70, pp 2437-2441

changes along with the nature of field attenuation. It is shown that the Maxwell equations become nonlinear in the case of degenerate semiconductors and semimetals due to phonon heating. The authors note that the results indicate the considerable effect of phonon heating on the propagation of electromagnetic waves in a semiconductor plasma; under phonon heating parameters of the phonon system enter into the coefficients of reflection and other characteristics of the electromagnetic field so that high-frequency methods can be used to study not only the electron but also the phonon system.

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1/2 015 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--FREE SUBUNITS OF RNA POLYMERASE IN NORMAL AND PHAGE INFECTED CELLS  
OF E. COLI -U-  
AUTHOR-(104)-BOGDANOVA, YE.S., ZOGRAP, YU.N., BASS, I.A., SHEMYAKIN, M.F.  
COUNTRY OF INFO--USSR  
SOURCE--MOLEKULYARNAYA BIOLOGIYA, 1970, VOL 4, NR 3, PP 435-444  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--ESCHERICHIA COLI, PHAGE, RNA, ENZYME  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1999/0386 STEP NO--UR/0463/70/004/003/0435/0444  
CIRC ACCESSION NO--AP0122567  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0122567

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ADDITION OF SUPERNATANTS OBTAINED AFTER ULTRACENTRIFUGATION (5.5 HOURS; 300,000 G) OF THE NONINFECTED CELLS LYSATES OF E. COLI (STRAINS B, 3.050, TS 19) RESULTS IN A SHARP INCREASE OF ACTIVITY OF THE HEATED E. COLI RNA POLYMERASE. THIS ACTIVATION IS CONNECTED WITH SMALL PARTICLES (SIMILAR TO 3-5S) AND IS ELIMINATED BY ANTIBODIES AGAINST PURIFIED E. COLI RNA POLYMERASE. THE INCREASE OF ACTIVITY OF THE HEATED ENZYME IS, THEREFORE, DUE TO THE PRESENCE OF THE SMALL COMPONENT OF POLYMERASE IN THE ULTRACENTRIFUGATES THAT MAKES POSSIBLE THE RECONSTRUCTION OF THE ENZYME FROM THE SMALL AND THE LARGE SUBUNITS. THE ULTRACENTRIFUGATE OF E. COLI B CELLS INFECTED WITH THE PHAGE T2 OR T4 OR WITH AN AMBER MUTANT N122 OF PHAGE T4, AS A RULE, DOES NOT ACTIVATE THE HEATED ENZYME. MOREOVER, IT SIGNIFICALLY INHIBITS THE RNA SYNTHESIS CATALYZED BY THE MIXTURE OF THE HEATED ENZYME AND THE ULTRACENTRIFUGATE FROM NONINFECTED CELLS, BUT DOES NOT AFFECT THE ACTIVITY OF THE NATIVE RNA POLYMERASE. INHIBITION IS NOT OBSERVED IN THE CASE WHEN THE RECONSTRUCTED ENZYME HAS ALREADY BEGUN TO SYNTHESIZE RNA BEFORE THE ADDITION OF THE ULTRACENTRIFUGATE FROM INFECTED BACTERIA. THE DATA OBTAINED MAKE IT POSSIBLE TO CONCLUDE THAT THE LYSATES OF THE INFECTED CELLS CONTAIN INHIBITOR WHICH SPECIFICALLY PREVENTS RECONSTRUCTION OF ACTIVE RNA POLYMERASE FROM ITS LARGE AND SMALL SUBUNITS. THE SUM OF RESULTS INDICATES THAT A MECHANISM OF REGULATION OF RNA POLYMERASE ACTIVITY MAY EXIST IN THE CELL, THAT ACTS ON THE LEVEL OF ASSOCIATION OF THE LARGE AND SMALL SUBUNITS OF THIS ENZYME.

FACILITY: INSTITUTE OF ATOMIC ENERGY, USSR, MOSCOW.

UNCLASSIFIED

USSR

UDC 621.039.512.45

BASS, L. P., BRODER, D. L., ZHILKIN, A. S., KUTUZOV, A. A., SMETANIN, A. A., SUVOROV, A. P., SHESTOPALOV, Ye. V., SHIPILOV, A. Ye.

"Reactor Neutron Spectra in a Cylindrical Neutron Duct Surrounded by Water"

V sb. Vopr. fiz. zashchity reaktorov (Problems in Reactor Safety Physics -- Collection of Works), No. 5, Moscow, Atomizdat, 1972, pp 123-129 (from RZh-50. Yadernyye reaktory, No 5, May 72, Abstract No 5.50.61)

Translation: The energy and spatial distributions of neutrons with energies above 200 kev in an iron cylindrical neutron duct at distances up to 66 cm from its origin are discussed. The experimental data are compared with computational results made by two-dimensional programs using the  $P_1$ -approximation of the spherical harmonics method and the  $2D_{10,5}$ -approximation of the characteristic method. The presence of experimental data on the neutron energy spectra makes possible a corrective check on the methods for calculating the parameters of shields of limited transverse dimensions.

7 ill., 8 ref.

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USSR

UDC 621.395.34

BASSALYGO, L. A., PINSKER, M. S.

"Concerning the Complexity of an Optimum, Nonblocking Switching Network Without Reorganization"

Moscow, Problemy Peredachi Informatsii, Vol 9, No 1, Jan-Mar 73, pp 84-87

Abstract: Assume that there are two nonintersecting groups of  $n$  subscribers in each and that it is required to construct an economic switching network which permits connecting any two free subscribers from different groups regardless of paired connections already existing in the system. This article deals with the problem of constructing switching circuits which satisfy the given condition and contain the least possible number of elements. Exact formulation of the problem is based on the ideas of graph theory with certain preconditions.

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USSR

UDC 621.395.34:62-7

B  
BASSALYGO, L.A., GRUSHKO, I.I., NEYMAN, V.I.

"Control by Separated Systems of Single Commutation"

V sb. Veroyatnosti. zadachi v strukturno-slozhn. sistemakh kommutatsii (Probability Problems in Structurally Complex Commutation Systems -- Collection of Works), Moscow, "Nauka," 1969, pp 29-43 (from RZh-Elektrosvyaz, No 4, Apr 70, Abstract No 4.64.24)

Translation: In contrast to the fully-accessible Kloc circuits in which any connection of inputs with outputs can be established without blocking of random paths and in any sequence, it is necessary in order to avoid blocking during establishment of connections in circuits of single commutation to take into account all information on a given set of connections. It is shown that in the opposite case (when only part of the information is used), blocking in the circuit is inevitable. A control algorithm is described for a three-stage circuit of single commutation, constructed of quadratic commutators. The algorithm reduces to an examination of a matrix of the attraction between commutators of the first and  
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BASSALYGO, L.A., et al, V sb. Veroyatnosti. zadachi v strukturno-slozhn. sistemakh kommutatsii, 1969, pp 29-43, (from RZh-Elek-trosvyaz', No 4, Apr 70, Abstract No 4.64.24)

third stages and the expansion of this matrix to the sum of quasi-unitary matrixes containing units, the number of which is equal to the class of the matrix, where one column or one row does not contain more than one unit. Derivation of quasi-unitary matrices leads to the Hungarian (vengerskiy) method of solution of the problem of choice. The algorithm described is generalized for the case of a multi-stage circuit, which is considered as a multi-stage structure consisting of a succession of three-stage circuits. An appraisal of the complexity of the algorithm is conducted. 6 ill. 9 tables. 6 ref. V.N.

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1/2 011 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--PRESENT DAY RELATIONSHIP BETWEEN THE THEORY OF HIGHER NERVOUS  
ACTIVITY IN MAN AND PSYCHOLOGY -U-  
AUTHOR--BASSIN, F.V. B  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR, VOL 25, NO 1, 1970,  
PAGES 9-15  
DATE PUBLISHED-----70  
SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES, BIOLOGICAL AND MEDICAL  
SCIENCES  
TOPIC TAGS--NEUROPHYSIOLOGY, PSYCHOLOGY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
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CIRC ACCESSION NO--AP0130021  
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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0130021

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MATTER OF RELATIONSHIP BETWEEN PSYCHOLOGY AND THE TEACHING ON HIGHER NERVOUS ACTIVITY IN MAN MERITS DISCUSSION ON TWO PLANES: THEORETICAL AND ORGANIZATIONAL. WE SHALL DWELL MAINLY ON THE FORMER. WE THEREFORE BELIEVE THAT ONE OF THE MOST IMPORTANT TASKS TODAY FACING THE SCIENCES DEALING WITH THE BRAIN IS TO ELIMINATE THE OBSOLETE SEPARATION OF EXPERIMENTAL AND THEORETICAL RESEARCH IN THE FIELD OF PSYCHOLOGY AND THEORY OF HIGHER NERVOUS ACTIVITY. THERE ARE MANY REASONS TO BELIEVE THAT A TRUE APPROXIMATION OF PSYCHOLOGICAL AND NEUROPHYSIOLOGICAL DATA AND CONCEPTIONS SO LONG AWAITED BY ALL OF US (INCLUDING I. P. PAYLOV) CAN BECOME THE MOST IMPORTANT EVENT IN DEVELOPMENT OF BRAIN SCIENCES WITHIN THE NEXT TEN YEARS. AND THE TYPICAL INIQUENESS OF APPROACH ASPECTS INHERENT TO EACH OF THESE DISCIPLINES CONSTITUTES MERELY YET ANOTHER ARGUMENT CONFIRMING THE URGENT NEED FOR THEIR INCREASINGLY CLOSE, MUTUALLY SUPPLEMENTARY COOPERATION. FACILITY: INSTITUTE OF NEUROLOGY, USSR ACADEMY OF MEDICAL SCIENCES, MOSCOW.

UNCLASSIFIED

USSR

B

UDC 621.375.9

BATANOV, V. A., BUNKIN, F. V., PROKHOROV, A. M., Academician, and FEDOROV, V. B.,  
Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR, Moscow

"Gas Dynamic Molecular Laser With Optical Pumping"

Moscow, Doklady Akademii Nauk SSSR, Vol. 191, No. 6, 1970, pp 1267-1269

Abstract: Molecular gas lasers with incoherent optical pumping are claimed to have a relatively broad spectral band for the absorption of pumping light in a relatively narrow width of the working transition line. An infrared molecular laser is proposed with optical pumping to the molecules' rotation-vibration band in the electron ground state by incoherent radiation from a "fixed" shock-wave which arises during the stationary flow of the working gas mixture from a nozzle in an underexpanded state into a gas atmosphere. The composition of this gas may either coincide or not coincide with the composition of the working mixture. The working mixture in this discussion is assumed to be  $\text{CO}_2 + \text{N}_2 + \text{He}$ , in which the helium plays the same role as in  $\text{CO}_2$  lasers with an electric discharge. It is noted that the nitrogen is not necessary to obtain inversion but it is desirable since it increases the effective lifetime of the upper laser level  $00^0_1$  (sic) and broadens the effective rotation-vibration band of the pumping absorption.

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BATANOV, V. A., et al., Doklady Akademii Nauk SSSR, Vol 191, No 6, 1970,  
pp 1267-1269

This version of the laser is intended to overcome technical difficulties encountered in IR molecular lasers with optical pumping in the traditional tube version, which were the restricted choice of optical materials in the IR range for laser tube with CO<sub>2</sub> gas and for pumping tubes, and also eliminate the requirement of maintaining a fairly high temperature of the working mixture ( $\sim 200^{\circ}\text{K}$ ). Specific parameters are proposed for this laser to produce a power of approximately 500 w at one meter.

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1/2 027 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--INFLUENCE OF SAMPLE SIZE ON THE VOLT AMPERE CHARACTERISTIC IN MEDIA  
WITH AN AMBIGUOUS DEPENDENCE OF ELECTRON TEMPERATURE ON FIELD STRENGTH  
AUTHOR--(03)-BASS, F.G., BOCHKOV, V.S., BUREVICH, YU.G.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,  
NR 5, PP 1814-1824  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRIC ENERGY, ELECTRON TEMPERATURE, PERTURBATION, ELECTRIC  
HYSTERESIS, VOLT AMPERE CHARACTERISTIC

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3001/2237

STEP NO--UR/0056/70/058/005/1814/1824

CIRC ACCESSION NO--AP0127599

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UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0127599

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ENERGY BALANCE EQUATION IS SOLVED AND ALL POSSIBLE STATIONARY DISTRIBUTIONS OF ELECTRON TEMPERATURE OVER THE CROSS SECTION OF A FINITE SIZE SAMPLE ARE DETERMINED. A CLASSIFICATION OF THE DISTRIBUTIONS IS PRESENTED. ONLY ONE OF THEM IS STABLE WITH RESPECT TO SMALL PERTURBATIONS; DEPENDING ON SAMPLE SIZE AND ELECTRIC FIELD STRENGTH THIS MAY BE EITHER A HOMOGENEOUS OR MONOTONOUS DISTRIBUTION. FOR SUFFICIENTLY THICK SAMPLES THERE EXIST RANGES OF FIELD STRENGTH VALUES FOR WHICH NOT A SINGLE SOLUTION EXISTS. THIS LEADS TO HYSTERESIS IN THE VOLT AMPERE CHARACTERISTIC. VOLT AMPERE CHARACTERISTICS FOR SAMPLES WITH DIFFERENT TRANSVERSE DIMENSIONS ARE PLOTTED. FACILITY: INSTITUT RADIOFIZIKI I ELEKTRONIKI, AN UKR. SSR FIZIKO-TEKHNICHESKIY INSTITUT NIZKIKH TEMPERATURE, AN UKR. SSR.

UNCLASSIFIED

USSR

UDC 620.172.2

CHERNYAK, N. I., ~~BASTUN, V. N.~~, PELEPELIN, V. M., SHKARAPUTA, L. M., Kiev

"Deformation Curves of VT-6S and VT-14 Titanium Alloys at 20-400°C"

Kiev, Problemy Prochnosti, No 6, 1972, pp 65-67.

Abstract: Results are presented from tensile testing of heat-treated VT-6S and VT-14 titanium alloys at 20-400°C. Deformation curves are presented. Within limits of deformation of approximately 1%, the curves can be approximated by a second-order equation. Changes in the primary mechanical characteristics of the alloys with increasing temperature are shown. Tubular thin wall specimens were tested, with outer diameters of 29.5 mm, wall thickness 0.75 mm, and gage length 100 mm. For both alloys, the maximum divergence of calculated data from experimental data is not over 4%. The data produced indicate that the influence of elevated temperature on the characteristics tested is approximately the same for both materials.

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USSR

UDC: 620.178.4/6

BASTIN, V. N., PELEPELIN, V. M., SHKARAPUTA, L. M., Institute of Mechanics, Academy of Sciences of the UkrSSR, Kiev

"Particulars of Deformation of Titanium Alloys in the Plane Stressed State"

Kiev, Prikladnaya Mekhanika, Vol 8, No 4, Apr 72, pp 93-99

Abstract: Taking VT-6S and VT-14 titanium alloys as an example, the authors investigate the applicability of certain hypotheses of plasticity theory to the evaluation of limiting states, and establish the region of principal stresses in the plane stressed state where the form of the stress deviator has a definite effect on the deformation curve. The plane stressed state was produced by loading thin-walled tubular specimens by axial force and internal pressure. It was found that a unique curve describes deformation in stress-strain coordinates for the given alloys. In the region of biaxial tension where the transverse (tangential) stress is greater than the longitudinal stress ( $\sigma_t > \sigma_l > 0$ ), a deviation from the unique curve is observed. This is attributed to anisotropy in the metal. The average normal stress has no appreciable effect on behavior of the deformation curve. The effect of the stress deviator in the region where  $\sigma_t > \sigma_l > 0$  is that greater hardening corresponds to the greater absolute

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BASTUN, V. N. et al., Prikladnaya Mekhanika, Vol 8, No 4, Apr 72, pp 93-99

value of the Lode strain parameter. The curves for limiting states of elasticity, yield and fracture in the region where  $\sigma_1 > \sigma_2 > 0$  and  $\sigma_2 > 0 > \sigma_1$  are described by the Mises condition for an isotropic body. In the region of positive stresses with greater principal transverse stresses, there is a slight swing toward the St. Venant condition. Similitude of stress and strain deviators is observed at values of the Lode strain parameter of  $|\mu_0| = 1$  or  $\mu_0 = 0$ . At intermediate values, deviations are observed which are more noticeable at negative values of  $\mu_0$ . Five figures, bibliography of fourteen titles.

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USSR

UDC: 669.15--194:546.76

BASTUN, V. N., GOLOVINSKAYA, T. M., and CHERNYAK, N. I., Institute of Mechanics, Academy of Sciences, Ukrainian SSR, Kiev

"Investigating the Yield Point and the Structural State of the Initial Anisotropy of a Titanium Alloy"

Kiev, Fizika i Khimiya Obrabotki Materialov, Vol. 6, No. 5, 1970, pp 21-24

Abstract: As the subject of their investigations, the authors chose tubes made of VT-1 titanium alloy. These were given uni-axial and biaxial stretching, and their structure was taken into account in the measurements. This approach was used because the effect of plastic deformation on the structural state has barely been touched on, and there are no data on the importance of the tension state of the material. The preliminary results of the tests showed that the material has significant anisotropy of the elastic and durability characteristics. Specimens were tubes with an outside diameter of 32.5 mm and a wall thickness of 2.2 mm; after the mechanical processing, the wall thickness was 0.7 mm and the diameter 30.5 mm. The tests were made on the TSMU-

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USSR

BASTUN, V. N., et al., Fizika i Khimiya Obrabotki Materialov, Vol 6, No 5, 1970, pp 21-24

30t machine, in which the specimens can be given axial loads and internal pressures in various permutations. In the experimental procedure, measurements of the longitudinal and transverse deformations were made through the use of mechanical tensometers with micron indicators. The radial deformations were found by computations based on the assumption of elastic change in the volume of the material. X-ray analysis showed that undistorted coarse-crystalline structure of  $\alpha$ -titanium, and single-axial transverse stretching up to the point of 2% plastic deformation caused no marked change in the material's crystalline structure. There were structural variations in regions of small deformations only with deformation components coinciding with the tube axis.

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USSR

UDC: 539.4.013

BASTUN, V. N., Kiev

"The Influence of the Geometric Shape of a Structure on its Load-Bearing Ability"

Kiev, Prikladnaya Mekhanika, Vol 18, No 8, Aug 73, pp 57-63.

Abstract: Based on the use of the phenomenon of loss of stability of a deformation process, consisting in a reduction in load following achievement of a maximum value, as applicable to the case of biaxial extension, the influence of the geometric shape of a structure on its limiting stresses and strain is studied. The analytic dependence is compared to experimental data produced by testing of tubular specimens of high-strength steel and titanium alloys loaded by an axial force and internal pressure.

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BASURMANOV, O.K.

*biophysics*

UNCLASSIFIED

Page

SECTION III 33: SUBJECTS ASSIGNED TO FACULTY

PC5-25  
June 71

Name: Institute of Biophysics, Pushchino

Description:

(U) During this quarterly reporting period, 13 new articles were located from the Institute of Biophysics at Pushchino. On the basis of these articles, it was possible to associate 19 new persons with the Institute. These persons are listed below together with the subjects and dates of the articles:

<u>Basurmanov, O. K.</u>	<i>All-Union</i> endocrine system	1970 (17)
<u>Rutenskiy, G. N.</u>	phospholipids	1970 (18)
<u>Gaziyev, A. I.</u>	DNA	1970 (19)
<u>Ivanukova, A. G.</u>	plant physiology	1969 (20)
<u>Kisilev, Ye. Ye.</u>	muscle physiology	1970 (21)
<u>Kravchenko, N. A.</u>	EPR spectra	1970 (22)
<u>Karimov, A. A.</u>	radiation effects	1970 (23)
<u>Panov, A. A.</u>	endocrine system	1970 (17)
<u>Pasoyan, V. G.</u>	EPR spectra	1970 (22)
<u>Porotikov, V. I.</u>	muscle physiology	1970 (21)
<u>Posnikova, G. B.</u>	chromatography	1970 (24)
<u>Rashin, V. D.</u>	phospholipids	1970 (18)
<u>Rovin, A. F.</u>	radiation effects	1970 (23)
<u>Sukhoruchikina, L. V.</u>	chromatography	1970 (24)
<u>Titchev, K. S.</u>	plant physiology	1969 (20)
<u>Vanillov, Yu. V.</u>	radiation effects	1970 (23)
<u>Zaklin, A. N.</u>	hydrogen peroxide	1970 (25)
<u>Zakharovskaya, D. T.</u>	DNA	1970 (19)
<u>Zuzin, A. M.</u>	DNA	1970 (19)

USSR

UDC 612.822.3.087

BASYLEVICH, T. F., and NEBYLITSYN, V. D., Institute of General and Pedagogical Psychology, Academy of Pedagogical Sciences USSR, Moscow

"Mechanism of 'Splitting' of the Negative Component of the Motor Evoked Potential"

Leningrad, Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenov, No 8, 1972, pp 1295-1297

Abstract: In a previously reported series of experiments, a majority of human subjects given proprioceptive stimulation, the motor evoked potential exhibited a division of the main negative component into two half-waves separated by a small time interval. It was assumed that this splitting of the negative component was due to the fact that specific and nonspecific impulses caused by passive muscular movement reach the cortex at different times. In other words, the initial excitation while the second phase reflects negativity caused by nonspecific excitation. To test this assumption, the same subjects were given chlorpromazine (which mainly inhibits some structures of the reticular formation) prior to recording of the motor evoked potential. Chlorpromazine was found to alter the configuration of the potential by abolishing or reducing the late half-wave of the negative component regardless of the intensity of stimulation, but it had no significant effect on the 1/2

USSR

BASYELEVICH, T. F., and NEBYLITSYN, V. D., Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenov, No 8, 1972, pp 1295-1297

on the parameters and shape of the early components, although the latency periods were somewhat shortened while the amplitudes were lengthened.

2/2



USSR

UDC 621.039.5.16.25

BAT', G. A., GULIMOV, V. N., ZARUBIN, YU. V., OBUKHOV, V. K., and USHAKOV, YU.V.

"Temperature Effect in the Range of 20-250° C for Several Strictly Regular Heterogeneous U-H<sub>2</sub>O Critical Assemblies"

Moscow, Atomnaya Energiya, Vol 30, No 4, Apr 71, pp 354-358

Abstract: A good description of the function  $N_{cr}(T)$  is a sufficiently reliable proof of the adequacy of the computational method and the judiciousness of the simplifications employed in it for describing the design of a reactor. Unfortunately, however, there are few experimental data on the effects of reactivity in reactors, and it is usually assumed that about a 20% accuracy in predicting the temperature effect of the reactivity is adequate. The integral nature of the critical experiments makes it possible to obtain only minimal data on each specific assembly. However, if enough such experiments are carried out, it may be possible to supplement these data on the micro-parameters or even perhaps to change them considerably.

The authors describe the fuel elements and the test stands and provide a table showing the composition of the fuel in weight %. They include a section on the experimental procedure and cite the results from the tests.

1/2

USSR

BAT', G. A., et al., Atomnaya Energiya, Vol 30, No 4, Apr 71, pp 354-358

Five graphs are given which show the critical mass versus other factors. The computational and the measured results agree satisfactorily.

The article contains 1 table, 5 figures, and a bibliography of 3 titles.

2/2

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USSR

UDC 632.95

OVCHINNIKOV, P. N., BAT', I. I., MIRONOVA, G. A., and GINZBURG, B. R.

"Study of the Kinetics of the Liquid Phase Reduction of 3-Chloro- and 3,4-Dichloronitrobenzenes Over Platinized Carbon"

Alma-Ata, Katalitich. reaktsii v zhidkoy faze (Catalytic Reactions in the Liquid Phase) Nauka, 1972, pp 399-403 (from Referativnyy Zhurnal -- Khimiya, No 7, 1973, Abstract No 7N687 by T. A. Belyayeva)

Translation: The preparative technology for chloro- and dichloroanilides used as poly products during the synthesis of herbicides is based on the catalytic reduction of the corresponding nitro compounds with  $H_2$  under a pressure of 200-300 atm, in the presence of 0.5 to 1% platinized carbon. It was shown that the rate of reduction of  $3-ClC_6H_4NO_2$  and  $3,4-Cl_2C_6H_3NO_2$  in a 75% ethanol on 0.5, 1, and 2% platinized carbon was proportional to the concentration of the active complex on the catalyst surface. The reaction rate is limited by the activation of  $H_2$ .

1/1

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USSR

UDC 621.791.55:/661.857+669.14/

BEREZHNITSKIY, S. N., BATAKSHEV, A. F., MITUS, A. K., ARTEMOV, N. S., and OFITSEROV, A. M., Engrs.

"Welding of Silver to Steel"

Moscow, Khimicheskoye i Neftyanoye Mashinostroyeniye, No 11, Nov 71, p 21

Abstract: Ag cannot be welded to steel directly, because it forms no compounds or solid solutions with Fe. Use of an intermediate layer of pure Cu is unsatisfactory, because deoxidizers and modifiers are absent in Cu, so that pores and cracks develop in the welded joints. Use of standard welding wires of Cu alloyed with Si, Ni, Mn, Ti, and Fe was tried in the lap and butt welding of Ag to steel in experiments in which pure Ag 2 mm thick was welded with steel St. 3 2-11 mm thick. Welding wires with a diameter of 2-3 mm that consisted of bronze Br. KMts 3-1 or bronze Br. MNZh KT5 - 1-0.2-0.2 were used. Welding was carried out manually in Ar with a direct current arc (150-200 A, 15-18 V) at a rate of 15-20 m/hr. The joints that formed had a sufficient mechanical strength and retained their tightness in vacuo at temperatures up to 779°, the melting point of the Ag-Cu eutectic. Microstructural analysis on etching with 4% HNO<sub>3</sub> showed that defects (cracks, 1/2

USSR

BEREZHNITSKIY, S. N., et al., Khimicheskoye i Neftyanoye Mashinostroyeniye,  
No 11, Nov 71, p 21

pores, and lack of joining) were absent in the transitional zone between  
Ag and steel. The procedure that has been developed is being applied in  
the experimental production of equipment made of Ag and Ag-clad steel and  
welded with Br. MNZh KT5-1-0.2-0.2.

2/2

Aluminum and Its Alloys

USSR

UDC: 546.3-19'682'67

BATALIN, G. I., KAZIMIROV, V. P. and DMITRUK, B. F., Kiev

"Structure and Electrical Resistance of Molten Aluminum"

Moscow, Izvestiya Akademii nauk SSSR, Metally, No 1, Jan-Feb 72, pp 88-94

Abstract: Described is an x-ray diffraction study of the structure of molten aluminum at 720, 1020, 1400°C. The intensity lines were produced on a diffractometer in molybdenum K<sub>α</sub> radiation monochromatized with a pair of Zr-Y differential filters. The maximum statistical calculation error in the experimental intensity lines was 3% for 720 and 1020°C and 4.5% for 1400°C. The results indicate that structurization in molten aluminum occurs on the basis of a blurred face-centered cubic lattice up to 1400°C. The principal changes in the shape of the radial atomic distribution curves are related to the intensification of thermal atomic motion due to increasing temperatures resulting in a gradual leveling of the first and second maxima on the curves. The discrepancy of the computed electrical resistance values from the experimental data is likely to be attributed to the extreme sensitivity of the calculation to both the height and steepness of the first maximum

1/2

USSR

BATALIN, G. I., et al, Izvestiya Akademii nauk SSSR, Metally, No 1, Jan-Feb 72, pp 88-94

structural factor as well as to the magnitude and form of the employed pseudopotential. (3 illustrations, 4 tables, 17 bibliographic references).

2/2

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USSR

UDC 669.715'782

BATALIN, G. I., BELOBORODOVA, YE. A., and STUKALO, V. A., Kiev

"Study of Thermodynamic Properties of Al-Si Melts"

Moscow, IAN SSSR, Metally, No 2, Mar-Apr 71, pp 69-74

Abstract: The thermodynamic properties of liquid alloys of aluminum with silicon were determined over a broad concentration range by the emf method. Two series of experiments were performed: the first series involved seven alloys with silicon contents up to 35 at. % in the 950-1270°K temperature range; in the second series of experiments, five alloys with high silicon contents (from 45 to 80 at. % Si) were studied in the 1350-1650°K temperature range. The data produced agree well with the phase diagram of the Al-Si system. Throughout the entire range of concentrations, the isotherms of activity of the components show negative deviations from ideal solutions. Al-Si liquid alloys are characterized by significant positive values of integral heats and excess entropies of formation. The maximum values of these functions are strongly shifted toward the alloys rich in aluminum.

1/1

- 1 -



1/2 034 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--THERMODYNAMIC PROPERTIES OF GERMANIUM ZINC MOLTEN ALLOYS -U-  
AUTHOR--(03)-BATALIN, G.I., BELOBORODOVA, YE.A., STUKALO, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, METAL. 1970, (2), 147-51.  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, MATERIALS  
TOPIC TAGS--THERMODYNAMIC PROPERTY, GERMANIUM ALLOY, ZINC ALLOY,  
NONFERROUS LIQUID METAL, ENTHALPY, ENTROPY, ELECTROCHEMISTRY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1613 STEP NO--UR/0370/70/000/002/0147/0151  
CIRC ACCESSION NO--AP0125235  
UNCLASSIFIED

2/2 034

UNCLASSIFIED


PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0125235

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMODYNAMIC PROPERTIES OF LIQ. SOLNS. OF GE AND ZN WERE STUDIED BY MEASURING OF EMF. OF THE ELECTRODE, CONCN. CELL  $Zn(l), ZnCl_2$  IN MELT ( $KCl$  PLUS  $NaCl$ ),  $(Ge, Zn)(l)$ , WHERE THE AT. FRACTION OF ZN AND THE TEMP. RANGE WERE 0.9079-0.2240 AND 950-1230DEGREESK, RESP. FOR THE ABOVE AT. FRACTION OF ZN AT 1230DEGREESK THE TEMP. COEFF. OF EMF. AND THE EMF. WERE 0.00649 TO 0.11112 MV-DEGREE AND 6.322 TO 91.305 MV. THERMODYNAMIC QUANTITIES WERE CALCD. FROM THE DATA OBTAINED FOR ZN AND GE AT 1230DEGREESK. FOR THE AT. FRACTION OF GE OF 0.1-0.9 AT 1230DEGREESK THE VALUES OF INTEGRAL FREE ENERGY, ENTHALPY, ENTROPY, EXCESS FREE ENERGY, AND EXCESS ENTROPY ARE GIVEN. THE EMF. WAS A FUNCTION OF THE TEMP. IN HOMOGENEOUS SOLNS. AND DEVIATED FROM THE STRAIGHT LINE WHEN THE SOLNS. STARTED TO BE HETEROGENEOUS. THE TEMP. CORRESPONDING TO THE BEGINNING OF THE DEVIATION IS THE CRIT. TEMP. OF CRYSTN. OF THE SOLN. IN QUESTION. IN THIS WAY, FOR THE SOLNS. CONTG. 0.49, 0.57, 0.62, AND 0.68 AT. FRACTION OF GE, THE TEMPS. OF CRYSTN. WERE FOUND TO BE 723, 773, 798, AND 824DEGREESC, RESP.

UNCLASSIFIED

USSR

UDC: 621.384.6.5 

ARZUMANOV, A. A., NEMENOV, L. M., ANISIMOV, O. K., BATALIN, S. S.,  
VOLKOV, B. A., GROMOV, D. D., KRAVCHENKO, Ye. T., KRUGLOV, V. G.,  
NIGMATOV, M. Kh., POPOV, Yu. S., PROKOV'YEV, S. I., and RYBIN, S. N.

"Isochronic Cyclotron With Controllable Ion Energy"

Alma-Ata, Izvestiya AN KazSSR--Teriya Fiziko-matematicheskaya, No 4,  
1973, pp 6-15

Abstract: A discussion of the isochronic cyclotron with controllable ion energy built around the U-150-2 accelerator installed in the Institute for Nuclear Physics of the Kazakh SSR Academy of Sciences in 1965 is given. Calculations of the fundamental parameters made with an electronic computer are presented, together with the results of a theoretical analysis, a large part of which was based on approximation methods. These results were verified by a numerical method. The description is given of a program developed for investigating and modeling the magnetic field on a mock-up with a scale of 1:3. An outline drawing of the magnetic arrangement is given, along with curves of the magnetic field. The current correction for the magnetic field is explained, with an illustrative photograph of the correction winding. Also discussed are the  
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USSR

UDC: 631.384.6.5

ARZUMANOV, A. A., et al, Izvestiya AN KazSSR--Teriya Fiziko-  
matematicheskaya, No 4, 1975, pp 6-15

high-frequency system and the slit-type ion source, the ions entering the accelerator chamber radially. Curves for the change in beam intensity for accelerated alpha particles are plotted as a function of the accelerator radius. A photograph of the area of installation, showing a beam of protons in air with an energy of 30 Mev, is reproduced together with a photograph of the equipment itself.

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1/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--DEHYDROGENASE ACTIVITY OF THE URINE CANCER PATIENTS -U-  
AUTHOR--BATALIN, V.I. *B*  
COUNTRY OF INFO--USSR  
SOURCE--LAB. DELO 1970, (11), 50-1  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--DEHYDROGENASE, ENZYME ACTIVITY, INHIBITION, URINE, CANCER  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/0215 STEP NO--UR/9099/70/000/001/0050/0051  
CIRC ACCESSION NO--AP0119211  
UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70  
CIRC ACCESSION NO--AP0119211  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. NONSPECIFIC DEHYDROGENASE  
INHIBITORS ARE FOUND IN THE URINE OF CANCER PATIENTS. FACILITY:  
KUIBYSHEV, MED. INST., KUIBYSHEV, USSR.

UNCLASSIFIED

USSR

UDC 564.621

BATALIN, Yu.V., KASIMOV, B.S., and STANKEVICH, Ye.F. (Geological Institute, Kazan')

"Dawsonite, a Possible Source of Aluminum Production"

Moscow, Razvedka i Okhrana Nedr, No 7, July 71, pp 59-62

Abstract: This article contains a review of potential world resources of dawsonite. In the USSR dawsonite has been found in the Donbass region in the form of needle-shaped crystals, and also in the trans-Carpathian region in mercury deposits and Neogenic deposits. Transcaucasia is considered to be a prospective region for dawsonite, because underground sodium carbonate-containing highly mineralized waters are widespread within its limits, and analcite-zeolite rocks are known in Mesozoic and Cenozoic deposits.

1/1

USSR

UDC 621.373.039.7

KUREBATOV, L.N., KOZINA, G.S., FAVORIN, V.N., ~~BATALINA, K.A.~~ BIBIKOV, YE.V.,  
VLASOV, A.N., DEMIDOV, S.S.

"Some Characteristics Of Small-Sized Pulsed Laser With Electron Excitation"

Radiotekhnika i elektronika, Vol XVII, No 6, June 1972, pp 1240-1245

**Abstract:** The principal characteristics are presented of a small-sized electron-beam pulsed laser with a high radiated power. Feasible types of laser targets are discussed. The construction is shown of a complex multi-element target with passive regions. Graphs are shown of 1) The dependence of the radiated power of a single-layer target on the power of the exciting electron beam; 2) The dependence of the radiated power of a multilayer target ("cake") on the power of the electron beam; and 3) The dependence of the radiated power on the pulse recurrence frequency of the exciting electrons for a "cake" target. A graph is also shown of the angular distribution of the emission of single-layer and multilayer targets in a vertical plane coincident from the direction of the electrons and in a horizontal plane coincident from the bombarded surface of the crystal. The authors thank N.A.Iofin, Ye.D. Naumenko, A.I.Solovychik, I.Ya. Gol'dshteyn, and S.S. Shakhidzhanov for valuable consultations and aid in the work. 8 fig. 9 ref. Received by editors, 30 May 1971.

1/1



1/2 018 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--RADICAL EXCHANGE IN ORGANOMETALLIC COMPOUNDS. XII. MOLECULAR FORM  
OF PHENYL LITHIUM IN RADICAL EXCHANGE REACTIONS -U-  
AUTHOR-(02)-BATALOV, A.P., ROSTOKIN, G.A.  
COUNTRY OF INFO--USSR *B*  
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(4), 842-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--EXCHANGE REACTION, ORGANOLITHIUM COMPOUND, CHEMICAL KINETICS,  
MONOMER, ISOTOPE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3006/1500 STEP NO--UR/0079/70/040/004/0842/0846  
CIRC ACCESSION NO--AP0135161  
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0135161

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETIC CURVES WERE SHOWN FOR REACTIONS OF "PRIME14 C SUB6 H SUB5 LI" WITH PHLI IN ET SUB2 O IN THE 20-34DEGREES INTERVAL. RADICAL EXCHANGE IN PHLI OCCURS IN THE MONOMERIC FORM OF PHLI RATHER THAN IN THE DIMER; THE DISSOCN. CONSTS. OF THE DIMER WERE CALCD. TO BE FROM 0.95 AT 20DEGREES TO 0.93 AT 34DEGREES. FACILITY: NAUCH.-ISSLED. INST. KHIM., GOR'K, FOS. UNIV. IM, LOBACHEVSKOGO, GORKI, USSR.

UNCLASSIFIED

USSR

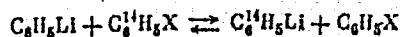
UDC: 547.353.4-541.127-4

B  
BATALOV, A.P., and ROSTOKIN, G.A., Scientific Research Institute of Chemistry at Gorkiy State University imeni N.I. Lobachevskiy, Gorkiy, Ministry of Higher and Secondary Specialized Education RSFSR

"Radical Exchange in Organometallic Compounds. XII. Molecular Form of Phenyllithium in Radical Exchange Reaction"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, pp 842-846

Abstract: The article considers the question of the molecular form of phenyllithium taking part in the following exchange reaction at the stage determining its kinetics:



(X=Cl, Br, I). It is shown that phenyllithium takes part in monomeric

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USSR

BATALOV, A. P., and ROSTOKIN, G. A., Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, pp 842-846

form. This is confirmed by kinetic studies. A method is suggested for determining the dissociation constant of the dimer of phenyllithium, based on kinetic exchange reaction studies.

USSR

UDC 621.372

BATALOV, B. V., HAZENKOV, G. G., KOTKO, A. P., and RUDEENKO, A. A.

"Algorithm for Statistical Analysis of Electronic Circuits"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn.  
(Collection of Scientific Works on Problems in Miniature Electronics, Moscow Institute of Electronic Engineering) No 9 (Fiz.-mat. seriya), pp 61-67, 1972 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10A113)

Translation: An algorithm for statistical analysis of electronic circuits in the algorithm language ALGOL-60, using the TA-1M translator for the M-20 digital computer, is proposed.

1/1

BATALOV, B.V.

Microelectronics

MICROELECTRONICS

Excerpts from Russian-language book edited by F. V. Lukin;  
Mikroelektronika, No 5, 1972, Sovetskoye Radio Publishing House,  
Moscow, UDC 621.382.621.396.6-181.5.

UDRS 57333  
25 October 1972

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Obituary of Fedor Viktorovich Lukin.....	2
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[I - USSR - F]

the dimensions of the active components, the influence of the dimensions being more significant as the required power of the circuit is less. The authors study the influence of the capacitance of the emitter junction of a microemitter transistor on the speed of response of the TTL of the circuit.

The article contains 6 figures, 2 tables, and 4 bibliographic references.

UDC 621.396.6-181.5

Basic Ways of Increasing the Quality of Logic Integrated Microcircuits. Yanushonits, S. S. In the Collection *Mikroelektronika*, edited by T. V. Lukin, No 5, p. 110, Sovetskoye Radio Publishing House, 1972.

This article defines the functional relationship between the product  $FT$  and other physical parameters of space, bounded by an arbitrary surface. On the basis of the obtained dependence the article discusses ways of increasing the speed of response and decreasing the scattering power of the logic integrated microcircuits.

The article contains 2 bibliographic references.

UDC 621.382.21

Use of Nonlinear Programming for Optimal Computation of the Geometric Dimensions of the Regions of Transistors of Integrated Circuits. Kazemov, G. G., Batlov, B. V., Ibradeva, A. V., and Rucenko, A. A. In the Collection *Mikroelektronika*, edited by T. V. Lukin, No 5, p. 118, Sovetskoye Radio Publishing House, 1972.

A method is suggested for solving problems of synthesizing active components based on the use of nonlinear programming equipment. The article gives a block-diagram of the program algorithm and a specific example of the optimal computation of the geometric dimensions of the regions of a transistor for an integrated semiconductor circuit.

The article contains 4 figures, 1 table, and 8 bibliographic references.

UDC 621.396.6-181.5

Structure of Micropower Integrated Internal Memory on Uniform Subsystems on Supplemented MDP Transistors. Gordeyev, B. K., et al. In the Collection *Mikroelektronika*, edited by T. V. Lukin, No 5, p. 126, Sovetskoye Radio Publishing House, 1972.

USSR

UDC 621.396.6-181.5

BATALOV, B. V., KAZENNOV, G. G., KOTKO, A. P., KURMAYEV, F. A., RUEK-  
RO, A. A.

"Evaluating the Uniformity of Parameters of Transistors in Integrated  
Semiconductor Circuits"

Elektron. prom-st'. Nauch.-tekhn. sb. (The Electronics Industry. Scien-  
tific and Technical Collection), 1971, No 1, pp 47-50 (from RZh-Radio-  
tekhnika, No 7, Jul 71, Abstract No 7V271)

Translation: A procedure is developed for quantitative evaluation of  
the degree of uniformity of the parameters of transistors in integrated  
semiconductor circuits. The procedure can be used for designing cir-  
cuits as well as for inspection under production conditions. Taken as  
the measure of uniformity is the pair correlation coefficient which  
enables determination of the conditional distributions of parameters.

1/1

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UDC:662.215.2

USSR

AL'TSHULER, L. V., BALABANOV, A. V., BATALOV, V. A., ROMIONOV, V. A.,  
TARASOV, D. M., Moscow

"X-Ray Structural Study of the Initial Stage of Development of an Under-  
ground Explosive Cavity in Sandy Soil"

Novosibirsk, Fizika Goreniya i Varyva, Vol. 6, No. 3, Sep 70, pp. 363-373

Abstract: The authors studied the kinetics of development of underground explosive cavities in various media, including study of the earliest phases of these processes, in order to determine the effective mechanical characteristics of soils, to test and clarify the equations of state of the explosion products and current calculation methods. The experimental observation was performed by transmission of x-rays through massive sections containing explosive charges in short bursts of x-rays. This report describes the experimental methodology and data produced in non-saturated sand, and also presents idealized mathematical calculations of underground explosions in compressible media, which are used for interpretation of the results produced.

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1/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--NATURE OF FALSE PEAKS IN A FARVITRON, IRON MASS ANALYSIS, SPECTRUM  
AND MEANS FOR ELIMINATING THEM -U-  
AUTHOR--(04)-LINNIK, L.N., LOBACHEV, K.I., LINNIK, N.N., BATALOV, V.S.  
COUNTRY OF INFO--USSR  
SOURCE--PRIB. TEKH. EKSP. 1970, (2), 178-81.  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--SPECTRUM, ION, OSCILLATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3007/0869 STEP NO--UR/0120/70/000/002/0178/0181  
CIRC ACCESSION NO--AP0136303

*B*

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70  
CIRC ACCESSION NO--AP0136303  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REASONS ARE GIVEN FOR THE  
OCCURRENCE OF FALSE, FRACTIONAL, AND MULTIPLE MASS PEAKS IN THE  
FARVITRON SPECTRUM. SOME MEASURES FOR PREVENTION OF FALSE PEAKS ARE  
DESCRIBED. BY USING THE RELATION BETWEEN THE AMPLITUDES OF THE SIGNALS  
OF THE MULTIPLE AND BASE MASS, IT IS POSSIBLE TO DET. THE COEFF. OF ION  
ESCAPE IN THE PROCESS OF OSCILLATION IN THE DRIFT SPACE.  
FACILITY: NAUCH. ISSLED. EKSP. INST. PERERAB. KHIM. VOLOKON, USSR.

UNCLASSIFIED

USSR

UDC 778.155.43:778.19

BATALOV, YU. V., MIROSHNIKOV, M. M., Doctor of Sciences, and PORFIR'YEVA, N. N.,  
Candidate of Sciences

"The Contrast Method of Processing Mars Photographs"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 9, Sep 73, pp 11-12

Abstract: The usefulness of the contrast method of processing photographs has been proven useful for improving the quality of the investigated photographic images. In this article are presented the procedure and results of processing, by the contrast method, six photographs of Mars taken from a space vehicle. An analysis of the photographs obtained as a result of the contrast treatment shows that this method makes it possible to resolve additional details of the features of Mars, that are not visible or are poorly distinguishable on the initial plate. 10 figures. 3 references.

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USSR

UDC: None

BATALOV, Yu. V.

"Results of the Competition for the Best Theoretical Work in the Leningrad Division of the Scientific Technical Radio Engineering Society imeni A. S. Popov"

Moscow, Radiotekhnika, Vol. 26, No. 2, 1971, pp 110-111

Abstract: This competition was organized by the Leningrad Administration of the A. S. Popov Scientific Technical Radio Engineering Society for the best theoretical work in the area of electronics and communication, on the occasion of Lenin's 100th birthday. The first prize was awarded to A. M. Zayezdnyy, Ye. I. Plotkin, and Yu. A. Cherkasskiy for their paper "New Methods for Processing Signals Based on the Use of Their Structural Characteristics," in which the authors consider models which are the result of a comparison of various signal phase coordinates. Second prize went to V. F. Nesteruk for his paper "Optimal Radio Signal Reception on the Basis of Minimax 'Game Principle'" which used game theory for

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USSR

BATALOV, Yu. V., Radiotekhnika, Vol 26, No 2, 1971, pp 110-111

solving the problem of optimal reception of signals of unknown frequency. This paper is scientifically important and arrives at original results. Third prize was split between V. G. Morozov and L. S. Perel'man. Other award winners are mentioned.

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USSR

BATALOVA, N.

"Superpure Metals"

Moscow, Moskovskaya Pravda, 4 Feb 73, p 4, Cols 5-8

Translation: A section devoted to the collection of superpure metals was organized at the Institute of Physical Problems, Academy of Sciences USSR.

In one of the rooms of the Institute, I was shown several small drawers similar to those used in libraries. Each drawer was designated with symbols of chemical elements from Mendeleev's Periodic Table. All drawers contained unique first samples of this unique collection. Samples were in test tubes, ampoules, polyethylene pockets, or simply wrapped in parchment, and each sample was supplied with a label indicating the date it was received by the institute, the name of the organization which sent the sample, and the name of the author who produced the superpure metal.

What does this collection represent and what is its purpose?

"It is well known," says N. Ye. Alekseyevskiy, corresponding member of the Academy of Sciences USSR, "that metals have been used in industry for a long time. However, only in the 20th century has an intensive study of the properties of metals been started. One of the directions of these studies is,

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USSR

BATALOVA, N., Moskovskaya Pravda, 4 Feb 73, p 4, Cols 5-8

for example, the behavior of the conduction electrons in metals. The presence of these electrons makes metals differ from other solid bodies in regard to their low electrical resistance. When temperature is low the electrical resistance of metals decreases, and at the temperature of liquid helium ( $-269^{\circ}\text{C}$ ) its value, which is usually called the residual resistance, is practically determined only by the amount of impurities in metals. Several metals, such as lead, tin, niobium, and vanadium, are transformed at low temperatures into the superconducting state and their electrical resistance becomes zero.

Studies conducted during the last two decades showed that an increase in metal purity makes it possible to detect in them some unknown properties which are related, for example, to the quantum nature of the conduction electrons. For example, a plate made of a pure metal single crystal placed in a magnetic field parallel to its surface can conduct electromagnetic radiation which is completely reflected by metal under ordinary conditions.

A change in resistance of a single crystal or pure metal placed in a magnetic field at low temperatures depends strongly on the orientation of crystal axes with respect to the direction of the magnetic field, and it can be increased in some cases hundred of thousands of times.

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BATALOVA, N., Moskovskaya Pravda, 4 Feb 73, p 4, Cols 5-8

The possibility of detecting some new, previously unknown properties in a metal increases with a decreasing amount of impurities in it.

It is quite possible that the behavior of electrons in pure metals will be used in the future for practical purposes, as we use the electronic properties of semiconductors today.

In order to study the properties of superpure metals and alloys, some of which are already used in industry, very pure metals are needed. The requirements regarding metal purity increases all the time.

Organization of the collection, headed by G. E. Karstens, who is also in charge of the Industrial Material Section of the institute, will facilitate the work of physicists-experimenters by making their work more productive. Results of these works would not only broaden our knowledge of the properties of metals but would also find their application in industry.

P. L. Kapitsa's collection of pure metals, called "Mendeleev's closet," served as the prototype for this collection. The collection presently contains almost all the metals of the Periodic Table. Chemists and physicists of various institutions and from industry take part in supplying the collection with new samples. However, the purity of metals in the collection differs. The collection does not as yet contain pure rare-earth metals. The organizers of the

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USSR

BATALOVA, N., Moskovskaya Pravda, 4 Feb 73, p 4, Cols 5-8

collection hope that the number of organizations participating in the collection will increase, as well as the purity and quality of metals.

Various institutes of our country will be able to use the collection of the Academy of Sciences USSR.

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BATANOV, V.A.

2001/12-16/15-11-12 91

Batanov, V. A., V. K. Goncharov, and L. Ya. Minko.  
Powerful optical crystal plasmatron. ZhPS. v. 16, no. 5,  
1972, 931-934.

A versatile laser-driven plasmatron is described which may be compared to the one described previously by Goncharov et al in this report. In the present design the simple chamber shown in Fig. 1 was used to

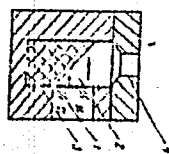


Fig. 1. Laser plasmatron  
1- quartz window; 2- chamber;  
3- target material; 4- exit nozzle

generate a plasma jet from any given target material, with the plasma driven out through the nozzle by generated pressure. By varying pulse parameters, chamber dimensions, fill gas, etc., a wide range of plasma jet characteristics can be obtained, ranging from subsonic to supersonic. The authors used an Nd glass laser at 0.8 millisecond pulses of 5 kJ peak energy, in a quasi-cw regime, to develop target surface densities on the order of  $10^6 \text{ w/cm}^2$ . Glass textile was used as target material, and helium at pressures from  $5 \times 10^{-2}$  to several atmospheres served as the fill gas. The many possible variations in jet parameters are discussed and both high-speed and streak photos are given of jet propagation. Table I compares results of two modes. The results generally show the versatility of this type of low temperature plasmatron.

USSR

UDC: None

BATANOV, V. A., BUNKIN, F. V., PROKHOROV, A. M., and FEDOROV, V. B.

"Light Self-Focusing in a Plasma and the Ultrasonic Ionization Wave in a Laser Beam"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, vol 16, No 7, 1972, pp 378-382

Abstract: This letter describes a new type of behavior of a plasma flare in which the flare almost fully absorbs a laser beam passed through it. In the experiment in which this phenomenon occurs, a bismuth target is vaporized by a laser beam into a helium atmosphere with a pressure of 2.5 to 5 atm. The laser beam has a wavelength of  $1.06 \mu$  and an intensity of  $10^7 \text{ W/cm}^2$ , emitted in a pulse of 1 ms duration. Photographs of the flare show the drift of the plasma cloud from the target and along the lens caustic, and they demonstrate the breakaway and drift of the flare from the target at the beginning of the process. The authors assert that they were the first, in 1969, to report this breakaway and thus to indicate the possibility of obtaining a strongly absorbent plasma by vaporizing a solid target. The photographs also indicate the

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BATANOV, V. A., et al., Pis'ma Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, vol 16, No 7, 1972, pp 378-382

development of the self-focusing effect, caused by the aforementioned lens, and the plasma bunching produced by the focusing. The front of the ultrasonic ionization wave is at the back of the plasma cloud, with the length of the cloud increasing as a result of the ionization wave-front motion in the direction of the laser beam. The authors are connected with the P. N. Lebedev Institute of Physics.

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USSR

BATANOV, V. A.; BUKHIN, F. V.; PROKHOROV, A. M.; FEDOROV, V. B. (Lebedev Physics Institute, USSR Academy of Sciences)

"Evaporation of Metallic Targets by Intense Optical Radiation"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; August, 1972; pp 586-606

ABSTRACT: A theory of evaporation of metals subjected to intense optical radiation is developed on the basis of the liquid-vapor phase transition. A method for the approximate solution of the Clapeyron-Clausius equation is suggested which permits one to determine the temperature of the surface of a target as a function of the incident radiation intensity  $I$  with accuracy sufficient for experimental purposes. It is shown that when a certain critical value of the intensity  $I_{td} \sim 10^7-10^8 \text{ w/cm}^2$  is exceeded, a new effect -- a "transparency wave" -- arises as a result of the loss of metallic properties by the target: in the front of the wave the liquid metal changes into a liquid dielectric. For  $I > I_{td}$  vaporization begins to take place at the surface

USSR

BATANOV, V. A., et al., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; August, 1972; pp 586-608

of the "transparent" (dielectric) layer, the temperature  $T_{nd}$  of which ceases to increase and remains below the critical value. This layer is separated from the metal by the front of the transparency wave propagating into the target. This transparency effect is accompanied by the appearance of a number of other effects which may serve for its observation: viz., a sharp drop of the target reflection coefficient, a considerable change in the dependence of the evaporation front velocity on  $I$ , and, finally, the appearance of a maximum followed by a monotonic decrease in the dependence of the specific recoil momentum on  $I$ . The latter effect was experimentally observed in the present investigation. The results obtained are presented in the paper.

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USSR

UDC 621.373:590.145.6

B  
BATANOV, V. A., YERSHOV, B. V., MAKSIMOV, L. P., SAVRANSKIY, V. V., FEDOROV, V. B.

"Laser Unit with Radiation Energy up to 10 Kilojoules for Investigating the Interaction of Powerful Luminous Fluxes with Matter"

Kratk. soobshcheniya po fiz. (Brief Reports on Physics), No 4, 1970, pp 8-14  
(from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8 D188)

Translation: This article contains a description of a device created on the basis of a neodymium glass laser ( $\lambda = 10,600 \text{ \AA}$ ) generating pulses with an energy to 10 kilojoules and  $\approx 1$  millisecond long. The intensity of the light flux reaches  $10^7 \text{ watts/cm}^2$  over an area of up to  $1 \text{ cm}^2$ . The device consists of three independent generators operating in parallel each of which contains three plane-parallel rods of neodymium glass pumped by pulse tubes. The experience in operating the device for three years has demonstrated that obtaining an energy of  $\sim 10$  kilojoules is possible 5-10 times, obtaining an energy of five kilojoules is possible 50 times without replacing the tubes, active elements and reflectors.

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UDC: 621.315.592

USSR

BATAVIN, V. V., MIKHAEV, V. M., and POPOVA, G. V.

"Nature of 1.26-1.30 eV Radiation Bands in the Photoluminescence Spectra of Gallium Arsenide With Copper Impurities"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1874-1878

Abstract: A number of earlier works have shown that in the luminescence spectra of undoped n-type GaAs in the presence of copper, radiation peaks with energies of 1.26-1.30 eV are observed. The authors of the present paper find that the nature of the recombination center corresponding to this energy band has been inadequately studied, and in this paper obtain additional information regarding the characteristics of the band, thus shedding additional light on the generation and nature of the recombination center. The experiments described were performed on n-type GaAs specimens obtained by gas-transport epitaxia in a broad range of copper concentrations and donor impurities. The acceptor concentrations and the mobility in each specimen were also measured, the latter by the van der Pau method in the 50-300° K interval. The photoluminescence spectra were obtained in the range of 4-300° K using the ILM-1 monochromator

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R002200310018-4"

USSR

UDC 636.24:621.32

BATARCHUKOVA, N. R., IRIKOVA, L. A.

"Light Sources With a Directional Movement of Cadmium-114 Atoms"

Trudy Metrologicheskikh Institutov SSSR (Works of the Metrological Institutes of the USSR), No 114 (174), 1970, pp 15-18 (from Referativnyy Zhurnal, Metrologiya i Izmeritel'naya Tekhnika, No 1, 1971, Abstract No 1.32.1372)

Translation: The article is devoted to a discussion of various designs of cadmium light sources. It is shown that lamps of the old design function with a large expenditure of cadmium over a very brief interval of time, and since cadmium-114 is an expensive material, it is necessary to design lamps with a packet of this material of a different design, which provides for the possibility of regeneration of the packet. Several new variants of lamps are proposed, in which the cadmium is regenerated during the process of burning of the lamp, and the quantity of the required element is very limited. Of particular interest is a lamp in the form of a ring. 3 figures. 4 bibliographic entries.

USSR

UDC: 621.315.592

BATAVIN, V. V., et al, Fizika i tekhnika poluprovodnikov, No 10,  
1972, pp 1874-1878

with a glass prism and the LG-75 laser as the excitation source;  
the receiver device for the radiation was the FEU-28.

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1/2 021 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--INFLUENCE OF SILICON DIOXIDE PARTICLES ON VOLT AMPERE  
CHARACTERISTICS OF P-N JUNCTIONS IN SILICON -U-  
AUTHOR--BATAVIN, V.V.  
COUNTRY OF INFO--USSR *B*  
SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(4), 760-3  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS  
  
TOPIC TAGS--SILICON DIOXIDE, VOLT AMPERE CHARACTERISTIC, PN JUNCTION,  
DIELECTRIC MATERIAL  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3007/0903 STEP NO--UR/0449/70/004/004/0760/0163  
  
CIRC ACCESSION NO--AP0136337  
UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136337

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISLOCATION FREE N-SI SAMPLES (RHO EQUALS 0.5 OHM-CM) WITH AN INITIAL O CONCN. OF (6-8) TIMES 10 PRIMEL7-CM PRIME3 WERE SUBJECTED TO PROLONGED HEATING AT 1000DEGREES, WHEREBY THE SUPERSATD. O SOLN. WAS ELIMINATED AND SPHERICAL SIO SUB2 PARTICLES WERE FORMED. P-N JUNCTIONS 2 MU DEEP AND 2 MM IN DIAM. WERE PREPD. BY B DIFFUSION AT 1000DEGREES DURING 6 HR. THE REVERSE BIAS VOLT AMPERE CHARACTERISTICS OF THE JUNCTIONS SUBJECTED TO DIFFERENT HEAT TREATMENTS ARE PRESENTED. NONTREATED SAMPLES SHOW A SHARP BREAKDOWN AT 60-75 V. THE PARTIAL ELIMINATION OF THE O SOLID SOLN. LEADS TO A STRONG DECREASE IN THE SLOPE OF THE REVERSE CHARACTERISTICS. FURTHER INCREASE OF THE HEAT TREATMENT DURATION BRINGS ABOUT STEEPER CHARACTERISTICS, WHEREBY THE REVERSE CURRENT OF THE P-N JUNCTION IS STRONGLY INCREASED. THE RESULTS ARE EXPLAINED IN TERMS OF MICROPLASMA GENERATION IN THE VICINITY OF THE SIO SUB2 PARTICLES. IN THE SPACE CHARGE REGION, THE DIELEC. SIO SUB2 PARTICLES ARE POLARIZED, WHEREBY THE LOCAL ELEC. FIELD DIFFERS FROM THE APPLIED ONE. THE REGION WITH A DEFORMED ELEC. FIELD AROUND A PARTICLE DEPENDS ON THE RADIUS OF THE LATTER. THE ASSUMPTION IS CONFIRMED BY EVALUATING THE RADII OF THE PARTICLES BY THE OPTICAL SCATTERING METHOD.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--DECOMPOSITION OF A SUPERSATURATED SOLID SOLUTION OF OXYGEN IN  
DISLOCATION FREE SILICON -U-  
AUTHOR--BATAVIN, V.V. *B*  
COUNTRY OF INFO--USSR  
SOURCE--KRISTALLOGRAFIYA 1970, 15(1), 125-35  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, PHYSICS  
TOPIC TAGS--SOLID SOLUTION, THERMAL STABILITY, SILICON DIOXIDE,  
PHOSPHORUS, CHEMICAL REACTION MECHANISM, ETCHED CRYSTAL, OXYGEN,  
CHEMICAL DECOMPOSITION, CRYSTAL VACANCY, CRYSTAL LATTICE DEFECT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1990/1453 STEP NO--UR/0070/70/015/001/0125/0135  
CIRC ACCESSION NO--AP0109513  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0109513

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PPTN. OF O (WITH FORMATION OF SIO SUB2 PARTICLES) IN A THERMALLY DECOMPD. SUPER SATD. SOLN. OF O IN DISLOCATION FREE SI, DOPED WITH P, WAS STUDIED AT 900-1200DEGREES. THE PPTD. PARTICLES WERE REVEALED BY CHEM. ETCHING. THE SIO SUB2 PARTICLES THAT WERE FORMED ARE OF 2 TYPES: SPHERICAL (ENCOUNTERED MUCH MORE FREQUENTLY) AND PLATELIKE. THE FORMATION OF THE FORMER TYPE CAN BE DESCRIBED MAINLY IN TERMS OF THE HOMOGENEOUS THEORY OF NUCLEATION, BUT AT HIGHER TEMPS. THE HETEROGENEOUS MECHANISM OF NUCLEATION CAN PLAY A MORE IMPORTANT PART AND THE CONC. OF FORMED SPHERICAL SIO SUB2 PARTICLES BECOMES DEPENDENT ON THE CONC. OF STRUCTURAL DEFECTS. THE FORMATION OF PLATELIKE SIO SUB2 PARTICLES, ON THE OTHER HAND, HAS A HETEROGENEOUS CHARACTER AND CAN BE VISUALIZED AS TAKING PLACE IN 2 STEPS: FIRST THE FORMATION OF LARGE COMPLEXES OF VACANCIES LEADING TO THE FORMATION OF STACKING FAULTS WITH A CLOSED DISLOCATION LOOP WHICH THEN SERVE AS SITES FOR PPTN. OF SUPERSATN. O SOLN.

UNCLASSIFIED

1/2 009 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--SYNTHESIS OF REPELLENTS. AMIDES OF O ALKYLPHOSPHORIC ACIDS -U-  
AUTHOR--(03)--LUCHKOVSKAYA, O.N., BATAYEV, P.S., TSIZIN, YU.S.  
CCOUNTRY OF INFO--USSR  
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(3), 644-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--ORGANIC SYNTHESIS, INSECT REPELLENT, ALIPHATIC PHOSPHORUS  
COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3001/0726 STEP NO--UR/0079/70/040/003/0644/0646  
CIRC ACCESSION NO--AP0126438  
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0126438

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. REACTION OF (ROSUB2 POCL WITH 3  
EQUIVS. AMINE IN ET SUB2 O OR C SUB6 H SUB6 GAVE: SHOWN ON MICROFICHE.

FACILITY: INST. MED. PARAZITOL. TROP. MED. IM. MARTSINOVSKOGO,  
MOSCOW, USSR.



USSR

UDC 51:621.391

KULIKOVSKIY, O. V. and BATAYEV, V. M.

"The Use of Error-Correcting Codes in the Digital Transmission of Color Polygraphic Images"

Tr. ucheb. in-tov svyazi m-vo svyazi SSSR (Proceedings of the Communications Educational Institutes of the USSR Ministry of Communications), No 63, 1973, pp 159 - 165 (from RZh Matematika, No 11, Nov 73); Abstract #11 V566

Abstract: The use of error-correcting codes to transmit color polygraphic images over communication channels is examined. Comparisons are made between the frequency band width required to transmit the image information in natural code and that required when error correction is done at all stages of code combination and at the highest levels only, using Hamming, Feyer, and Abramson codes.

Abstract by the authors.

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USSR

TAMARIN, P. V., BATDALOV, A. B., VOLGA, V. I., Institute of Semiconductors,  
Academy of Sciences of the USSR, Leningrad

"Effect of Alloying on Some Physical Properties of Graphite"

Leningrad, Fizika Tverdogo Tela, Vol 13, No 9, Sep 71, pp 2819-2821

Abstract: Data are presented on the effect which doping graphite with certain refractory elements has on electrical and thermal conductivity at temperatures from 2 to 2500°K. The effect of temperature and dopants on thermoelectromotive force is also investigated. It is found that the latter changes both in amplitude and sign with doping. Curves are given which show how this effect can be utilized in thermocouples using boron-doped and Zr+Si-doped graphite. The authors thank S. S. Shalyt for constant interest and for directing the work, and V. V. Popov for taking part in the measurements. Two figures, bibliography of two titles.

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USSR

UDC 8.74

BATECHKO, V. V., Editor

"Critical Path Method (Algorithms and Programs)"

Setevoye planirovaniye (Algoritmy i programmy) (cf. English above. Central Scientific-Research, Planning and Technological Institute of Organization and Technical Control), Minsk, 1971, 294 pp, ill., 63 k. (from RZh-Matematika, No 5, May 72, Abstract No 5V526K)

Translation: The work contains a set of algorithms and programs for calculating network time diagrams on the Minsk-22 electronic computer and is intended for specialists working on questions in the development and introduction of planning assignments through the use of Minsk-22 computer-based, critical-path methods.

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USSR

UDC: 8.74

BATECHKO, V. V. (editor)

"The Critical-Path Method (Algorithms and Programs)"

Setevoye planirovaniye (Algoritmy i programmy). TsNI proyektno-tekhnol. in-t organiz. i tekhn. upr. (cf. English above. Central Scientific Research and Design Institute of Management Organization and Technology), Minsk, 1971, 294 pp, ill. 64 k. (from RZh-Kibernetika, No 5, May 72, Abstract No 5V526 K)

Translation: The work contains a set of algorithms and programs for calculating network schedules with respect to time on the "Minsk-22" computer. The book is written for specialists dealing with the problems of the development and introduction of planning problems utilizing critical-path methods based on the "Minsk-22" computer.

1/1

1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--TRIPLET TRIPLET ANNIHILATION IN GLASSY SOLUTIONS OF TOLUENE AT  
77DEGREESK -U-  
AUTHOR-(04)-BATEKHA, I.G., ALFIMOV, M.V., GORDEYEV, V.I., SHEKK, YU.B.  
COUNTRY OF INFO--USSR **B**  
SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(3), 675-7  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--CHEMISTRY, PHYSICS  
TOPIC TAGS--TOLUENE, LUMINESCENCE SPECTRUM, NAPHTHALENE, LIGHT EXCITATION,  
PHOSPHORESCENCE, FLUORESCENCE, OCTENE  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/1624 STEP NO--UR/0048/70/034/003/0675/0677  
CIRC ACCESSION NO--AP0125246  
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

GIRC ACCESSION NO--AP0125246

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SENSITIZED LUMINESCENCE SPECTRUM OF A FROZEN SOLN. OF NAPHTHALENE, D SUBS (I) IN PHME UNDER EXCITATION OF DIFFERENT INTENSITIES AT 254 NM WAS MEASURED. A 100 FOLD INCREASE IN THE PHME EXCITING LIGHT INTENSITY RESULTED IN A SIGNIFICANT SUPPRESSION OF THE PHOSPHORESCENCE COMPONENT OF THE SPECTRUM OF I. THE TIME DEVELOPMENT OF THE PHOSPHORESCENCE AND FLUORESCENCE ON SWITCHING ON AND OFF A POTENT EXCITING LIGHT SOURCE (10 PRIME14 PHOTONS CM PRIME NEGATIVE2 SEC PRIME NEGATIVE1) WAS SHOWN AND, BESIDES THE COMMON SHORT TIME FLUGRESCENCE, AN ADDNL. DELAYED LONG TIME COMPONENT OF THE RADIATION WAS OBSD. THE DELAYED FLUORESCENCE FADED OUT IN 3 TIMES 10 PRIME NEGATIVE4 SEC AND ITS INTENSITY WAS PROPORTIONAL TO THE EXCITING LIGHT INTENSITY MULTIPLIED BY THE CONCN. OF THE TRIPLET MOLS. OF I. THE DELAYED FLUGRESCENCE WAS ASCRIBED TO AN ANNIHILATION INTERACTION OF THE TRIPLET EXCITATIONS OF PHME BY THE TRIPLET MOLS. OF I. ITS TIME DEPENDENCE WAS DETD. BY THE RATE OF ACCUMULATION OF THE TRIPLET MOLS. OF I AND BY THE LIFETIME OF THE PHME TRIPLET EXCITATIONS. THEORETICAL CONSIDERATIONS WERE VERIFIED EXPTL. BY USING THE SELECTIVE COMPETITIVE INTERACTION OF THE PHME TRIPLET EXCITATIONS WITH 1, OCTENE.  
FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.762.224:669.14.018.253

PETROV, A. K., LEVITIN, V. V., MIROSHNICHENKO, I. S., AKIMENKO, V. B., ANDREYEVA, A. YA., BATENEVA, M. K., GOLOVKO, V. A., LABUNOVICH, O. A., ORLOV, YU. G., and ORMAN, R. Z., Ukrainian Scientific Research Institute of Special Steels, Alloys and Ferroalloys, Dnepropetrovsk State University

"Study of Atomized Powders of High-Speed Steel and Blanks Made of Them"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 9-14

Abstract: This work was performed in order to study the structure of powders of high-speed steel produced by atomizing of liquid steel with a stream of pure argon applied to a stream of metal through a slit diaphragm at a pressure of 6-8 atm. For comparison, one melt was atomized using compressed air at 14-16 atm under industrial conditions. The structure and phase composition of the initial powder, powder after heat treatment, and blanks made from the powder were studied. Blanks produced by

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USSR

PETROV, A. K., et al., Poroshkovaya Metallurgiya, No 3, Mar 71,  
pp 9-14

hydrostatic pressing with subsequent sintering had a fine-grain structure with evenly distributed carbides. The structure corresponded to a hardness of 65 HRC after tempering at 560° and 61 HRC after tempering at 620°. This indicates the possibility of producing blanks from atomized powders of high speed steel.

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USSR

UDC 621.762.224:669.14.018.253

PETROV, A. K., LEVITIN, V. V., MIROSHNICHENKO, I. S., AKIMENKO, V. B., ANDREYEVA, A. YA., BATENEVA, M. K., GOLOVKO, V. A., LABUNOVICH, O. A., ORLOV, YU. G., and ORMAN, R. Z., Ukrainian Scientific Research Institute of Special Steels, Alloys and Ferroalloys, Dnepropetrovsk State University

"Study of Atomized Powders of High-Speed Steel and Blanks Made of Them"

Poroshkovaya Metallurgiya, No 3, Mar 71, pp 9-14

Abstract: This work was performed in order to study the structure of powders of high-speed steel produced by atomizing of liquid steel with a stream of pure argon applied to a stream of metal through a slit diaphragm at a pressure of 6-8 atm. For comparison, one melt was atomized using compressed air at 14-16 atm under industrial conditions. The structure and phase composition of the initial powder, powder after heat treatment, and blanks made from the powder were studied. Blanks produced by

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PETROV, A. K., et al., Poroshkovaya Metallurgiya, No 3, Mar 71,  
pp 9-14

hydrostatic pressing with subsequent sintering had a fine-grain structure with evenly distributed carbides. The structure corresponded to a hardness of 65 HRC after tempering at 560° and 61 HRC after tempering at 620°. This indicates the possibility of producing blanks from atomized powders of high speed steel.

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USSR

UDC 621.73.042.62-412

MAZHAROVA, G. YE., BATENEVA, M. K., SIDORENKO, G. V., GUPALO, V. G., and LUCHKOVA, L. I.

"Effect of Deformation on the Structure and Properties of R18 Steel"

Moscow, Kuznechno-Shtampovochnoye Proizvodstvo, No 7, Jul 71, pp 13-15

Abstract: The first ingots of R18 steel forged by upsetting have been tested at the Dneprospetsstal' Plant. Ingots from oneheat were forged by existing plant technology and by an experimental method.

Existing technology:

1. Heating an ingot weighing 590 kg in a continuous furnace up to 1250°C for one hour.
2. Drawing the ingot on a 5-ton drop forge along into a blank with a 260-mm square side and cutting into standard length.
3. Heating the standard blank in a continuous furnace up to 1250°C for 30 minutes.
- 1/3 4. Drawing the standard blank into a blank with a 160-mm square side.

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MAZHAROVA, G. YE., et al., Kuznechno-Shtampovochnoye Proizvodstvo, No 7,  
Jul 71, pp 13-15

5. Cooling the blanks in unheated coolers for 36 hours.

Experimental technology:

1. Same as 1 above.
2. Same as 2 above except 220-mm dimension is used.
3. Same as 3 above.
4. Upsetting standard blanks along the ingot axis to a height equal to  $1/2$ - $1/3$  the original height, turning  $90^\circ$  and drawing in a direction perpendicular to the ingot axis, down to ingots with a 120-mm square side with an intermediate heating to  $1250^\circ\text{C}$  for 15-20 min.
5. Same as 5 above.

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MAZHAROVA, G. YE., et al., Kuznechno-Shtampovochnoye Proizvodstvo, No 7, Jul 71, pp 13-15

As a result of increasing the forging reduction ratio and deformation of metal throughout its volume, crushing of the eutectic lattice occurs along with a more uniform distribution of the carbide phase. Mechanical properties of metal forged as described are better than when forged by the conventional technology, as a result of which transverse forging provides a deeper and more uniform working of the metal. A disadvantage of experimental technology is the additional preheating which lowers productivity of the forging machinery by 15-20%. Two figures, one table, three bibliographical references.

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USSR

UDC 669.14.018.25:621.762

DOROFYEV, Yu. G., PETROV, A. K., TSIPUNOV, A. G., USTIMENKO, V. I.  
MARINENKO, L. G., BATENEVA, M. K., and ORLOV, Yu. G., Novochoerkassk Polytechnic  
Institute, Ukrainian Scientific Research Institute of Special Steel

"Structure and Properties of R18 Cermet Steel"

Kiev, Poroshkovaya Metallurgiya, No 2 (122), Feb 73, pp 56-60

Abstract: Results are presented of investigations of the production of R18 high-speed cermet steel from pulverized powders by the method of dynamic hot-pressing. Steel productions using plasticizers and production in thin-sheet metal containers are investigated. The established optimum conditions for dynamic hot-pressing of R18 steel are as follows: heating temperature 1250-1280°C, reduced pressing work 25-30 kJ/cm<sup>2</sup>, aging time 10 min. The produced steel was practically without pores, it had a homogeneous microgranular structure corresponding to the structure of hardened steel, and it was without carbide liquation. Cutters of R18 cermet steel had a resistance twice as high as that of standard R18 steel. Three figures, seven bibliographic references.

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1/2 024 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--EXPERIMENTAL STUDY OF THE ELECTRICAL CONDUCTIVITY OF A  
NONEQUILIBRIUM HELIUM POTASSIUM PLASMA -U-  
AUTHOR--(02)-BATENIN, V.M., CHINNOV, V.F. *B*  
COUNTRY OF INFO--USSR  
SOURCE--TEPLOFIZ. VYS. TEMP. 1970, 8(2), 441-2  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--ELECTRICAL CONDUCTIVITY, POTASSIUM, HELIUM PLASMA, PLASMA  
CONDUCTIVITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3005/1406 STEP NO--UR/0294/70/009/002/0441/0442  
CIRC ACCESSION NO--AP0133358

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0133358

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELEC. COND. OF THE HE-K MIXT. WAS MEASURED AT ATM. PRESSURE, AND THE CALCD. VALUE OF THE KINETIC COEFF.  $K$  SUBSIGMA, WAS CHECKED EXPTL. THE D.C. ARC DISCHARGE WAS 100 MM LONG, AND  $K$  AMOUNT WAS (0.6-4) TIMES 10 PRIMENEGATIVE2PERCENT. PLOTS ARE SHOWN FOR THE DEPENDENCE OF THE ELEC. FIELD, GAS TEMP.  $T$  SUBA (MEASURED WITH W-KE THERMOCOUPLES), AND ELECTRON TEMP.  $T$  SUBE (MEASURED BY THE RECOMBINATION RADIATION INTENSITY) AS FUNCTIONS OF CURRENT (LESS THAN OR EQUAL TO 7 A). THE RADIAL DISTRIBUTION OF THE ELECTRON CONC.,  $T$  SUBE, AND  $T$  SUBA ARE SHOWN. FACILITY: INST. VYS. TEMP., MOSCOW, USSR.

UNCLASSIFIED



1/2 039 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--INDUCED ANISOTROPY OF CHEMICALLY PRECIPITATED IRON NICKEL  
PHOSPHORUS FILMS -U-  
AUTHOR-(04)-YERSHOV, R.YE., RYABININ, V.P., BATENKOVA, A.YA., LAZAREVA,  
L.V.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. VYSSH. UCHEB. ZAVED., FIZ. 1970, 13(3), 136-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, MATERIALS  
TOPIC TAGS--ANISOTROPY, IRON ALLOY, NICKEL ALLOY, PHOSPHORUS ALLOY, METAL  
FILM, SURFACE FILM, MAGNETIC FIELD  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1998/1030 STEP NO--UR/0139/70/013/003/0136/0136  
CIRC ACCESSION NO--AT0121626  
UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--30OCT79

CIRC ACCESSION NO--AT0121626

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INDUCED ANISOTROPY IN FILMS OF FE 14 PLUS NI 74 PLUS P 12PERCENT, 1 MU THICK, OBTAINED BY CHEM. PPTN. ON BRASS DISKS, 12 MM IN DIAM., WAS STUDIED IN MAGNETIC FIELDS OF 50-500 OE PARALLEL TO THE SURFACE. THE COERCIVE FORCE, H SUBC, INDUCED BY H IN FILMS ON ELECTROPOLISHED BRASS, AS A FUNCTION OF THE ANGLE, ALPHA, BETWEEN THE DIRECTION OF H DURING PPTN. AND THE DIRECTION DURING MAGNETIZATION, PASSED THROUGH A MAX. AT ALPHA EQUALS 90DEGREES. BUT IN FILMS PPTD. ON DISKS POLISHED SO THE SCRATCHES WERE PARALLEL TO EACH OTHER, THE H SUBC PASSED THROUGH A MIN. AT 90DEGREES; I.E., DIRECTED POLISHING OF THE SUBSTRATE INDUCED A HIGHER ANISOTROPY THAN A MAGNETIC FIELD. FACILITY: INST. FIZ., KRASNOYARSK, USSR.

UNCLASSIFIED